

# EXHIBIT A

WHATCOM WATERWAY

REMEDIAL INVESTIGATION/FEASIBILITY STUDY

SCOPE OF WORK

## PURPOSE

The purpose of this RI/FS Scope of Work (SOW) for the Whatcom Waterway is to implement the Agreed Order (AO) entered into by Ecology and G.P., to which this SOW is an Exhibit.

The RI/FS is intended to provide sufficient data, analysis, and engineering evaluations to enable Ecology to select a cleanup action alternative. It will include collection of information to evaluate the protectiveness and environmental effects of the cleanup action and any necessary mitigation, and to provide reasonable assurance that applicable laws will be met.

The RI/FS Scope of Work (SOW) is divided into six major tasks as follows:

- \* Progress Reports
- \* Work Plan
- \* Other Project Plans
- \* Remedial Investigation
- \* Feasibility Study
- \* SEPA Compliance

## TASK 1      PROGRESS REPORTS

G.P. shall submit progress reports every two months unless a longer reporting period is approved by Ecology in writing. Progress reports shall be submitted to Ecology until satisfaction of the AO in accordance with section VII of the AO. Progress Reports shall be submitted to the Ecology project coordinator by the 10th of every second month following the effective date of the AO. If this day is a weekend or holiday, deliverables will be submitted to Ecology on the next business day. At a minimum, progress reports shall contain the following information regarding the preceding reporting period:

- \* A description of the actions which have been taken to comply with the AO and SOW during the previous reporting period;
- \* An estimate of the percentage of RI/FS work completed to date;

- \* Summaries of sampling and testing reports and other data reports received by G.P.;
- \* Summaries of deviations from approved work plans;
- \* Summaries of contacts with representatives of the local community, public interest groups, press, and federal, state or tribal government;
- \* Summaries of problems or anticipated problems in meeting the schedule or objectives set forth in the SOW and Work Plan;
- \* Summaries of solutions developed and implemented or planned to address any actual or anticipated problems or delays;
- \* Changes in key personnel; and
- \* A description of work planned for the next reporting period.

## **TASK 2      WORK PLAN**

In order to plan and manage the RI/FS, G.P. shall document project tasks and management strategies in a RI/FS Work Plan. This work plan shall include an overall description and schedule of all RI/FS activities. The work plan shall not be implemented until approved by Ecology.

The Work Plan shall specify and describe all tasks to be accomplished to complete the RI/FS, including the evaluation of cleanup action alternatives and the identification of a preferred cleanup action alternative, in accordance with the AO, and this SOW.

The Work Plan shall clearly describe the overall project management strategy for implementing and reporting on RI/FS activities. The responsibility and authority of all organizations and key personnel involved in conducting the RI/FS will be outlined.

Elements of the Work Plan include, but are not limited to, the following:

- \* A project management strategy for achieving timely submittal of high quality deliverables;
- \* A draft outline of the final RI and FS Reports including the types of data evaluation, figures, and tables that will be included;
- \* A review of existing and available data to support the development of RI/FS tasks which may include, as appropriate, the following:
  - potential sources of contamination, including upland dredge material disposal sites and hazardous sites, and information on current and historical discharges
  - sediment and water quality chemical data, including contaminant concentrations and conventional parameters, depths and location of samples, and comparison to SMS and Water Quality criteria
  - bathymetric data, including information on bank elevations and slopes
  - fish and shellfish resources; recreational, commercial, and tribal fisheries
  - benthic, epibenthic, and fish community structure
  - toxicity testing and histopathology results
  - bioaccumulation in tissues
  - occurrence of endangered or threatened species and sensitive habitats (e.g. eel grass beds, spawning areas)
  - current patterns and velocity
  - rate of natural recovery
  - deposition/resuspension rates
  - current or planned land uses and their location, which may affect investigation and cleanup activities
  - dredging records including historical in-water dredge disposal sites
  - navigational depth requirements and locations
  - structure locations (e.g. piers, docks, outfalls)
  - recent and historical aerial photographs.

- \* A description of individual RI/FS subtasks;
- \* A proposed schedule, including a timeline for completion of all RI/FS subtasks and for submittal to Ecology of interim and final deliverables, including but not limited to the deliverables enumerated in this SOW;
- \* The proposed composition and individual qualifications of a technical team or teams of personnel and/or contractors responsible for RI/FS subtasks; consultants and laboratories used by G.P. under this Order shall have demonstrated experience with sediment sampling and analyses in accordance with the SMS.

### **TASK 3 OTHER PROJECT PLANS**

G.P. will prepare for Ecology review and approval a Sampling and Analysis Plan (SAP) and a Quality Assurance Project Plan (QAPP). A Health and Safety Plan (HSP) shall also be submitted but is not subject to Ecology approval. Details of these plans are provided below.

Sampling and Analysis Plan - G.P. shall prepare a Sampling and Analysis Plan (SAP) for RI sampling and analysis activities in accordance with WAC 173-340-820, WAC 173-204-600, and the Sediment Cleanup Standard User's Manual, as updated. The purpose of the SAP is to provide an overview of the RI sampling program that will obtain information needed to meet the data needs described in Task 4 of the SOW.

The SAP shall describe the sampling objectives and the rationale for the sampling approach. A detailed description of sampling tasks shall then be provided, including specifications for sample identifiers; vessel positioning; the type, number, and location of samples to be collected; the analyses to be performed; descriptions of sampling equipment and collection methods to be used; description of sample documentation; sample containers, collection, preservation and handling.

Quality Assurance Project Plan - G.P. shall prepare a Quality Assurance Project Plan (QAPP) for RI sampling and analysis activities. The QAPP shall identify and describe measures that will be taken during the performance of all sampling and analysis

tasks to ensure the fulfillment of data quality objectives. Data quality objectives will reflect the criteria or threshold values used for remedial decisions. The QAPP shall be developed in accordance with Ecology guidance and the requirements of the Ecology Laboratory Accreditation Program and the Puget Sound Estuary Program (PSEP) and contain the following elements:

- \* A brief project description, referencing the attached work plan and/or SAP for details
- \* Project personnel and QA responsibilities
- \* Quality assurance objectives
- \* Field QA measures, including sample acceptability criteria, field QA samples, and calibration of field instruments, referencing the SAP for a discussion of decontamination procedures and sample custody and handling
- \* Quality assurance for chemical analyses, including:
  - Calibration procedures, references, and frequency of calibration
  - Analytical methods
  - A table of laboratory QA samples for each analytical method, including blanks, duplicates/triplicates, MS/MSDs, SRMs, surrogate spikes, etc.
  - Data management, validation, and reporting
  - Assessment of data precision, accuracy, and completeness
  - Corrective actions
  - Quality assurance reports
- \* Quality assurance for biological testing, including:
  - Biological testing procedures, including detailed method descriptions
  - Laboratory QA, including use of positive controls, negative controls, reference sediments, measurement of water quality parameters, and any other QA procedures

described for individual biological tests in the 1995 PSEP protocols for bioassays and/or modifications required by Ecology.

- Bioassay performance standards and corrective measures
- Statistical methods used to test for statistical significance and to compare site data to reference data (if performed by the laboratory, otherwise include in work plan or SAP).
- Reporting of bioassay data
- Quality assurance reports

- \* Quality assurance for physical measurements (e.g. bathymetry, and currents) shall be consistent with PSEP protocols and current national guidance (e.g. Corps of Engineers manuals)

When possible, G.P. shall use an Ecology accredited laboratory accredited for the specific analyses to be performed under this Order. If an unaccredited lab is proposed to be used, the results of recent performance audits and systems audits will be provided to Ecology prior to use of the lab.

Health and Safety Plan - G.P. shall prepare a Health and Safety Plan (HSP) for RI activities in accordance with WAC 173-340-810. The HSP must be consistent with the requirements of the Washington Industrial Safety and Health Act of 1973, Chapter 49.17 RCW, including any updates or amendments. The HSP shall identify specific monitoring and management responsibilities and activities to ensure the protection of human health activities associated with the RI.

#### **TASK 4      REMEDIAL INVESTIGATION (RI)**

RI activities conducted by G.P. will enable Ecology to develop a proposed and, after public comment, final cleanup action plan for the Whatcom Waterway. The key components of this task are as follows:

- 1) Nature and extent of sediments exceeding SQS and MCUL
- 2) Assessment of potential human health concerns

- 3) Natural resource characterization
- 4) Physical characterization
- 5) Natural recovery evaluation (if proposed by G.P.)
- 6) Source control and recontamination evaluation

Details of these elements are provided below:

1) Nature and Extent of Sediments Exceeding SQS and MCUL - Surface sediment samples shall be collected from the biologically active zone (upper 10 centimeters). Subsurface sediment sampling may be restricted to those areas where dredging is likely to be a remedial action and/or to locations where current or future activities may expose deeper contaminated sediments.

The horizontal and vertical extent of sediments requiring remediation will be determined through one or more of the following approaches:

a. Biological Testing with Optional Chemistry

Biological testing, if conducted, will use the methods outlined in WAC 173-204-315, or other equivalent acute and chronic bioassays approved by Ecology. Additional sediment will be collected and archived, to be analyzed following receipt of biological testing results at G.P.'s option. Grain size and TOC will be analyzed along with bioassays to assist in interpreting results.

b. Chemical Analyses with Confirmatory Biological Testing

Samples shall be analyzed for relevant analytes listed in Table III of the Sediment Management Standards and for other deleterious substances that have been detected at the site or would reasonably be expected to be present. Analytical techniques will be sufficiently sensitive to detect chemical concentrations at or below sediment quality standards (SQS) and Puget Sound Dredge Disposal Analysis (PSDDA) screening levels (SLs).

Confirmatory biological testing may be conducted by G.P. to confirm exceedance of SQS or MCUL criteria, and may also be required by Ecology to evaluate the potential for adverse



effects associated with any detected chemicals lacking chemical criteria.

c. Concurrent Chemical Analysis and Biological Testing

Chemical analysis and biological testing will be conducted at each station. Biological tests will be conducted as described in (a) above. Chemical analyses may be limited to indicator chemicals useful in distinguishing sources or to the primary contaminants of concern.

Depending on site characteristics identified in the work plan, different approaches may be proposed for different areas of the site.

2) Assessment of Potential Human Health Concerns - WAC 173-204-570(5) requires that cleanup standards be protective of human health. If existing information is inadequate, G.P. may be required to perform additional bioaccumulation studies to determine the human health implications of ingesting marine organisms affected by site sediment contamination. Department of Health and Ecology Tier I guidance on human health standards for sediments will be used to calculate allowable tissue concentrations. Actual tissue concentrations will be compared to calculated allowable concentrations to evaluate potential human health concerns.

3) Natural Resources Characterization - Based upon existing natural resource information, G.P. may be required to collect additional general information on natural resources at or near the site that could be potentially exposed to contaminants, including but not limited to, habitat types, sensitive ecosystems, and plant and animal species. More detailed studies may need to be conducted through a work plan addendum if required to evaluate remedial alternatives.

4) Physical Characterization - Characterization of the physical nature of the site shall provide information necessary for preliminary evaluation of the remedial options. The physical characterization shall include substrate type (i.e., grain size) and distribution, total organic carbon, in situ density/water content, interstitial salinity (if bioassays are to be performed in areas influenced by freshwater), outfall locations, bathymetry, and the relationship between bathymetry and engineered waterfront structures (e.g., piers, wharves, buildings, dolphins, beams, embankments, bulkheads, etc.).

The purpose of the analysis will be to assess the effects of the engineered structures and other physical features on the effectiveness, implementability, and costs of remedial options.

5) Natural Recovery Evaluation - If G.P. proposes natural recovery for some areas of the site, additional analyses will be required by Ecology to determine if natural recovery is a feasible component of the selected remedial option. Sediment dating (e.g., <sup>137</sup>Cs and <sup>210</sup>Pb measurements), and sediment chronologies can be used to assess sediment accumulation and mixing. Modeling may be used to assess the potential for sediment natural recovery. However, because models may not adequately account for the all physical and hydrologic processes affecting sediment deposition and resuspension in Whatcom Waterway, modeling will be used only in conjunction with site specific data on key input parameters such as sediment accumulation rates. The development of natural recovery arguments shall be fully documented with actual field data or technical references.

6) Source Control and Recontamination Evaluation - G.P. will assess the potential for recontamination of site sediments from existing sources within or immediately adjacent to the site. This will be accomplished by identifying potential sources during the compilation of existing data and conducting surface sediment sampling designed to evaluate areas that may be impacted by these sources.

G.P. shall make recommendations to Ecology if further investigation or control of sources is needed.

If G.P., based upon the assessment described above, identifies a source(s) requiring further investigation which is attributable to current or historic G.P. activities (e.g. dredge disposal sites), the source shall be characterized.

The characterization shall be sufficient to determine if the source needs to be controlled prior to implementing a cleanup action at the Whatcom Waterway site. The characterization may include ground water, surface water, waste material and soil investigations.

**TASK 5      FEASIBILITY STUDY (FS)**

G.P. shall use the information obtained in the Remedial Investigation to conduct a Feasibility Study (FS). The FS will include: the determination of cleanup standards and applicable laws, identification and screening of cleanup technologies, assembly and screening of cleanup action alternatives, a detailed evaluation of remaining alternatives and the identification of a preferred cleanup action alternative. The FS will contain sufficient data and evaluations to enable Ecology to select a cleanup action alternative.

Cleanup Standards

The SMS at WAC 173-204-570 provide for site cleanup standards that may range from SQS to MCUL concentrations. The potential for natural recovery over a 10-year time frame may also be considered in establishing a site-specific cleanup standard. Site units may be defined for areas of the site if physical, chemical or biological differences (e.g. navigation lanes, intertidal areas) at the site create requirements for using different cleanup standards or technologies.

Determination of cleanup standards will consist, at minimum, of the following steps:

- \* Define site units; cleanup standards may be different for each site unit.
- \* Cleanup to SQS is considered the goal for all cleanups. If a less stringent standard is requested an evaluation will be performed after cleanup action alternatives have been identified. The evaluation will weigh costs, net environmental benefits and technical feasibility of the various possible cleanup levels.
- \* A site-specific natural recovery evaluation may be used to select the time frame, between 0 and 10 years, for achieving cleanup standards.

Identification and Screening of Cleanup Technologies

The cleanup technologies appropriate for use must be identified before cleanup alternatives can be developed.

The following basic steps for identifying and screening cleanup technologies will be performed.

- 1) Identify cleanup technologies based on cost, net environmental benefit, and technical feasibility.
- 2) Specific identified cleanup technologies can be eliminated from further consideration on the basis of technical implementability. This initial screening step considers the following information:
  - \* Contaminant distribution.
  - \* Contaminant concentrations.
  - \* Site characteristics. The location of the contaminated sediments may prevent the use of some removal technologies.
  - \* Sediment characteristics. The physical characteristics of the sediments may affect their ability to be effectively dredged or capped.

#### Assembly and Screening of Cleanup Action Alternatives

After applicable cleanup technologies have been identified, the technologies can be assembled into cleanup action alternatives and further defined for evaluation.

Details of these steps are provided below:

- 1) Assembly of Alternatives - Assembly of cleanup alternatives will begin with identification of the general response actions that may be used for cleanup at the site.

Appropriate cleanup technologies (for each site unit if applicable) will then be identified based on the contaminants and other important considerations. If site units have been identified at the site, general response actions and cleanup technologies for all site units will be considered as a whole system to ensure that they will work together. The primary considerations in combining technologies will be the overall effectiveness in providing a benefit to the environment and the ability to implement the cleanup alternative.

2) Screening of Alternatives - A screening of cleanup action alternatives will be performed to ensure that they will meet cleanup standards and other basic requirements. Prior to conducting the screening, the following information will be determined for each alternative:

- \* The combination of cleanup technologies and the location (site unit if applicable) where they could be used
- \* The estimated range of volumes to be removed, treated, or disposed of based on initial identification of cleanup standards
- \* The general costs of the method used to remove, treat, or dispose of material (unit costs).

3) Detailed Description of Screened Alternatives - For the cleanup action alternatives that are retained after screening, a preliminary design and cost estimate will be developed prior to the detailed evaluation and screening. The preliminary design will include volume and area calculations, plan and cross-section as required, treatability studies and treatment facility design if required, and any required disposal plans. Additional analysis will be included as necessary to fully evaluate the alternatives.

4) Evaluation of Screened Alternatives - After further development of the cleanup action alternatives retained after screening, a detailed analysis will be conducted according to specific criteria outlined in, Section 9.2 of the "Sediment Cleanup Standards User Manual", Ecology 1991, as updated, and in WAC 173-340-360. These criteria will be integrated and used to rate the strengths and weaknesses of each approach to identify a preferred cleanup action alternative.

#### **TASK 6      SEPA COMPLIANCE**

The work to be performed under this Order shall conform to the State Environmental Policy Act (SEPA) Rules, chapter 197-11 WAC, as amended on March 30, 1995. The amendment requires the integration of the procedural requirements and documents of SEPA and MTCA.

In accordance with WAC 197-11-253, Ecology is the SEPA lead agency for this site. As lead agency, Ecology has conducted a preliminary evaluation and decided that there is insufficient information available at this time to make a threshold determination.

The following steps will be taken by G.P. and Ecology to fulfill the MTCA/SEPA integration requirements:

Early Scoping - At a minimum, drafts of the work plan and other project plans will serve as the SEPA scoping documents. The public will be invited to review and comment on these plans in accordance with the Whatcom Waterway Public Participation Plan and the schedule in this SOW.

Threshold Determination - Based on the comments received from early scoping, Ecology will decide whether a SEPA threshold determination can be made. If a determination of significance (DS) can be made, the work plan will be revised as necessary to address development of an Environmental Impact Statement (EIS). If a threshold determination cannot be made due to insufficient information, or if Ecology makes a preliminary determination that a determination of nonsignificance (DNS) is appropriate, G.P. will submit an environmental checklist (SEPA checklist) along with the draft FS. Prior to issuing the draft final FS for public review, Ecology will make a threshold determination. If a DS is issued, G.P. will be required to prepare an EIS. Depending on its complexity, the EIS may be included as an appendix to the FS, integrated with the FS or prepared as a companion document.

## **DELIVERABLES**

All plans, reports and studies listed below shall be prepared as follows: A draft shall be submitted to Ecology and the landowners (owning lands within the site) for review and comment in accordance with Section V of the Agreed Order; Ecology and landowner comments shall be addressed and a draft final submitted to Ecology for public review; Ecology, with assistance from G.P., will prepare a Responsiveness Summary which will be included as an appendix to the final document; G.P. will prepare a final document addressing public comments for Ecology approval. Revisions to final plans shall be in accordance with Section VI of the AO. Modifications to final plans that Ecology determines are not significant will not be subject to public review.

- a. RI/FS Work Plan and Other Project Plans - G.P. shall submit for Ecology review and approval a RI/FS Work Plan, SAP, and QAPP in accordance with the schedule below. The HSP shall also be submitted but not reviewed by Ecology.
- b. RI Report - G.P. shall summarize and compile the results of Task 4 into an RI Report. The RI report shall follow the draft outline contained in the work plan as revised during the course of work. Revision of the outline shall require approval of Ecology.
- c. FS Report - G.P. shall prepare an FS Report in accordance with Task 5, including required SEPA documentation in accordance with Task 6.
- d. Additional Studies - G.P. shall submit draft addenda to the work plan, SAP and QAPP, as well as any other planning documents, reports, and other deliverables associated with any additional studies necessary as identified by Ecology, or G.P., in accordance with Section V of this Agreed Order within thirty (30) days of receipt of a written request by Ecology to prepare such documents, unless otherwise specified by Ecology.

#### **SCHEDULE**

The schedule for all tasks described in this SOW is presented below. If, at any time during the RI/FS process, unanticipated conditions or changed circumstances are discovered which may result in a schedule delay, G.P. shall bring such information to the attention of Ecology. Pursuant to Section VI(13) of the AO, Ecology will determine whether a schedule extension is warranted. For each and every deliverable, report, memorandum, plan, or other item required under this SOW, if Ecology disapproves or requires modification or revision of any deliverable, report, memorandum, plan, or other item, in whole or in part, G.P. shall submit a modified or revised version thereof to Ecology in accordance with Section V of the Agreed Order.

Any deadline which falls on a holiday or weekend will be extended to next business day.

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<u>RI/FS Actions</u>	<u>Completion Time</u>
Consultant Selection	60 days from effective date of AO
Draft RI/FS Work Plan SAP, QAPP, and HSP	120 days from consultant selection or effective date of AO, whichever is later
Public Review of Draft Final RI/FS Work Plan, SAP, QAPP, and HSP	30 days
Draft RI Report	270 days from Ecology Approval of the above documents <sup>*</sup>
Draft FS Report and SEPA Checklist	120 days from submission of Draft RI Report
Public Review of Draft Final RI and FS Reports Including Draft EIS (if necessary)	30 days Minimum
Final RI/FS Reports Including Final EIS (if necessary)	45 days from close of public comment period

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\* Bioassay testing and associated RI tasks may be delayed if Ecology and G.P. agree that this is necessary to ensure the availability and viability of bioassay organisms. Associated RI tasks include sampling that would be conducted concurrently with bioassay sampling using the same vessel and sampling equipment, or tasks that are contingent on interpretation of bioassay data. If a delay is agreed upon, a revised RI submittal date will be developed by Ecology and G.P. RI tasks unrelated to bioassay testing will continue according to the original work plan schedule.